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Special Article - The Relationship between changes in Interest Rates and Building Approvals

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INTRODUCTION

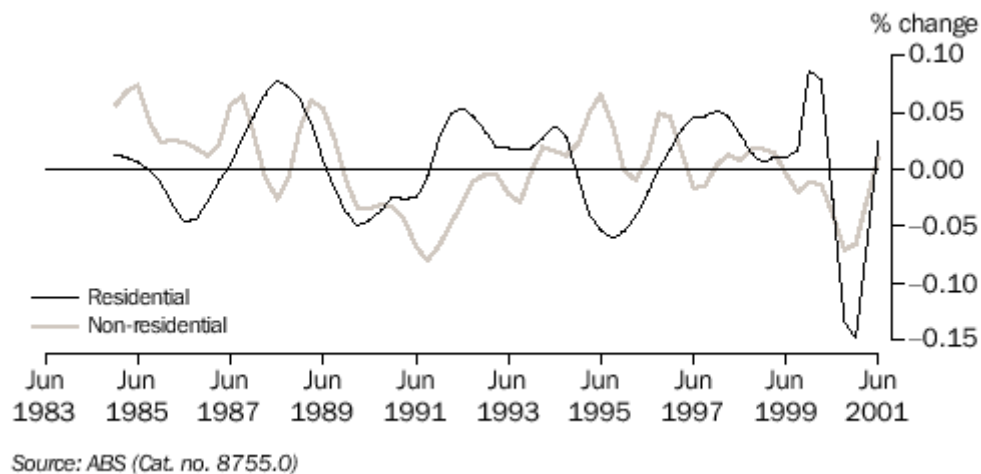
In the December quarter 2000 there was a seasonally adjusted fall in Gross Domestic Product of 0.4%. This fall was driven by substantial declines in private gross fixed capital formation on buildings. There were significant downturns in the construction industry from the September quarter 2000 onwards. Subsequently there were changes in interest rates and changes to the subsidy for first home buyers of new dwellings.

This article reports the results of an analysis the ABS has undertaken in response to these recent economic events. The specific focus of this analysis was to determine, if possible, the extent of any lags between general interest rate changes and new house construction. The application of this analysis should assist in the understanding of the apparent consequent impact of interest rate changes on the construction industry.

BACKGROUND

The long time period between the announcement of The New Tax System and its implementation opened up significant incentives to bring forward building activity prior to 1 July 2000. This resulted in a sharp increase in expenditure between September quarter 1999 and June quarter 2000, particularly in the residential construction sector.

GRAPH 1: VALUE OF BUILDING ACTIVITY, Chain Volume Measures (reference year 1999-2000) Trend Estimates



This bringing forward of activity supported construction work at levels well above the normal level of activity. As highlighted by the Commonwealth Bank of Australia (CBA):

“Falling housing affordability and demographic trends were signalling a peak in the housing construction cycle late in 1998. Instead dwelling investment continued to rise”. - Economic Outlook - Australia Sports Car or Lemon? Quarterly Prospects - June Quarter 2001, May 2001.

The increasing expenditure seen in the residential sector was also evident in non-residential construction activity, with the Sydney Olympic Games, in addition to The New Tax System, encouraging a significant bringing forward of activity in New South Wales. The strong increase in building activity in the first half of 2000 appears to be at the expense of activity in the second half of 2000, which subsequently suffered its biggest fall on record (see graph 1).

This fall, equating to a 10.0% decrease in the seasonally adjusted value of building activity work done, was the major contributor to the 0.4% December quarter 2000 fall in Gross Domestic Product. In that quarter the contribution of total private dwelling work to the change in GDP was -0.7 percentage points, following on from a contribution of -1.3 percentage points in the previous quarter. This decline in activity stimulated discussion about an appropriate policy response.

Much has been written on the effect of monetary policy and its transmission effect. It has been widely suggested that a cut in interest rates will flow through to the construction sector and give it a boost, the Reserve Bank of Australia in particular saying that:

“The improvement in affordability driven by recent falls in interest rates and the extension to the First Home Owner Grant (FHOG) scheme should spur growth in construction over the remainder of 2001.” - Statement on Monetary Policy, February 2001.

While in the long-term building activity is primarily impacted upon by the rate of household formation (for dwellings) and the overall level of economic growth (for other building), much of it is discretionary in the short term. It might therefore be expected that changes in the interest rate cycle might influence changes in the building cycle.

METHODOLOGY

This investigation studies building approvals, which are a leading indicator of future activity in the construction sector. Building approvals consist of residential, including housing, and non-residential approvals and are assumed, for the purpose of this analysis, to be influenced by

movements in interest rates. There is a strong correlation between building approvals and subsequent activity.

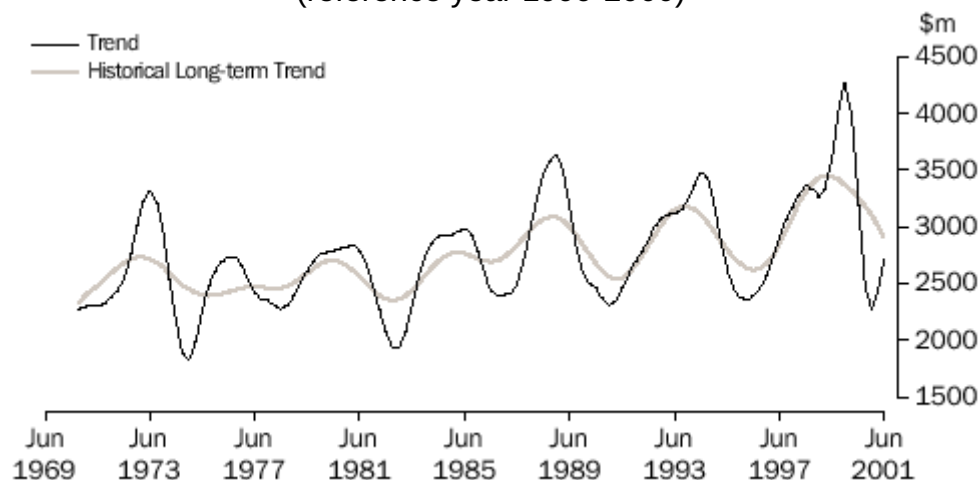
The investigation uses a business cycle approach. Other analytical methods such as econometric modelling can be used to focus on other aspects of building activity and the economy. The business cycle analysis used has been adapted from that described in the AEI article **The Business Cycle in Australia**¹. That article compared Gross Domestic Product and a range of leading indicators and attempted to identify correlations and lead/lag times. This paper applies the same basic methodology to compare new house building approvals and interest rates.

This method of cyclical analysis is known as the “growth cycles” approach and is used by institutions working on business cycle determination (OECD 1987)². In this method changes in short-term economic trends, corrected for seasonal, trading days and extreme movements, are compared with changes in the historical long-term trends.

In this case the filter used to extract the historical long-term trends (cycles of durations longer than 8 years) was a 33 term Henderson moving average. By using a moving average the resultant series gives an indication of sustained changes in the source series.

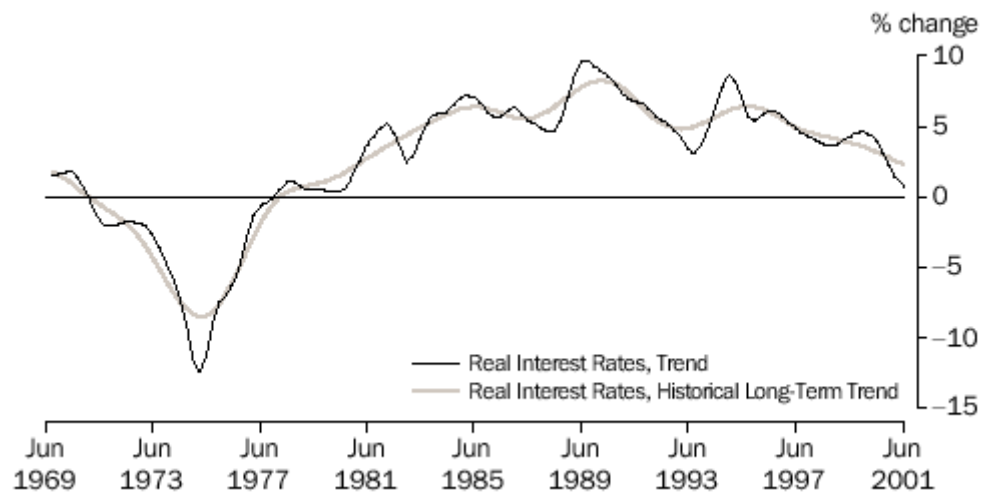
Graph 2 shows the quarterly chain volume measures of the value of new house approvals for the trend, which is calculated by using a 7 term Henderson moving average, and the long-term (33 term) trend. The business cycle is defined as the difference between these two series.

GRAPH 2: VALUE OF NEWHOUSE BUILDING APPROVALS, Chain Volume Measures
(reference year 1999-2000)



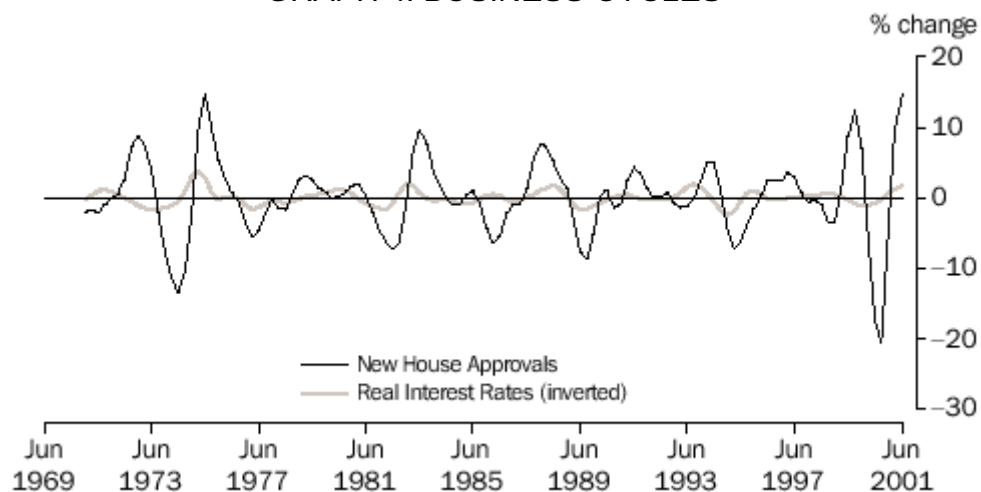
Graph 3 shows the trend and long-term trend for real interest rates. An estimate of real interest rates was computed by subtracting the annual growth in the private consumption deflator (growth from corresponding quarter the year before) from the quarterly average of the 90 day bank bill rate. The result can be negative when the private consumption deflator is greater than the average of the 90 day bank bill rate.

GRAPH 3: REAL INTEREST RATES



The business cycles in the value of house approvals and real interest rates series were calculated. The interest rate series was inverted (i.e. where changes in interest rates trend were above the changes in historical long-term trend this was shown as a negative) to enable easier identification of coincident cycles and the two series were superimposed (graph 4).

GRAPH 4: BUSINESS CYCLES



A visual examination of each series was then conducted to identify the turning points.

RESULTS

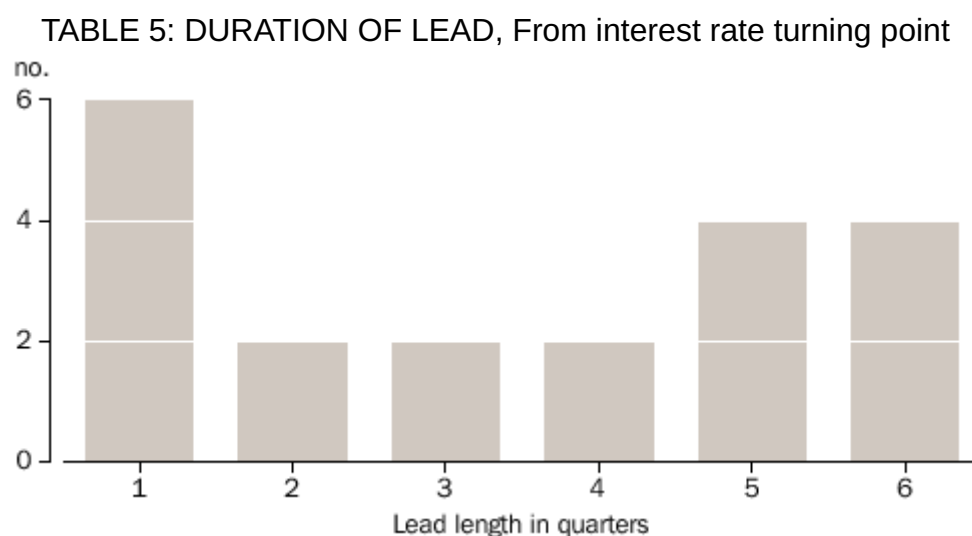
As can be seen above, a perfect matching of the cyclical fluctuations between the two indicators, namely with a regular lead or lag and all cycles present, is difficult to achieve as all economic cycles differ in their duration, amplitude, causes and effects. However, where the cycles did conform, lead and lag times were calculated for each turning point.

The visual analysis identified some ten peaks and eight troughs in the new house approvals series over the period September 1975 to December 2000. Corresponding turning points were identified in the interest rate series. These are shown in the table opposite.

QUARTER WHERE TURNING POINTS OCCURRED

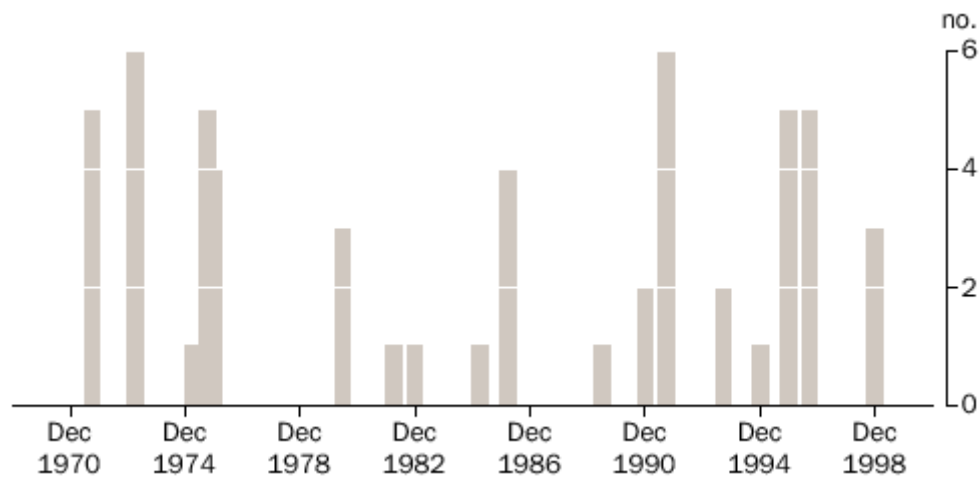
	Building approvals	Real interest rates	Lead of real interest rate turning point (quarters)
Peak	December 1972	December 1971	5
Trough	September 1974	March 1973	6
Peak	June 1975	March 1975	2
Trough	December 1976	December 1974	4
Peak	December 1977	September 1975	5
Peak	March 1981	June 1980	3
Trough	June 1982	March 1982	1
Peak	March 1983	December 1982	1
Trough	June 1985	March 1985	1
Peak	March 1987	March 1986	4
Trough	September 1989	June 1989	1
Peak	June 1991	December 1990	2
Trough	March 1993	September 1991	6
Peak	March 1994	September 1993	2
Trough	March 1995	December 1994	1
Peak	March 1997	December 1995	5
Trough	December 1998	September 1996	5
Peak	September 1999	December 1998	3

An examination of the amount of time by which the interest rate turning points led the associated new house approval turning point indicates that the lead time is somewhat bimodal in its distribution (graph 5). There were six instances of a one quarter lead, and eight instances of leads of five or six quarters. (In this analysis, it is assumed that interest rate changes lead changes in building activity rather than vice versa).



Moreover there is no clear indication that lead times are changing over time in a consistent direction (see graph 6). Accepting the limitations of this simplistic bi-variate analysis which ignores other factors that influence housing demand, this suggests there is no clear evidence to support speculation that building activity is currently more or less responsive to interest rate stimuli than in the past.

TABLE 6: TIMING OF NEW HOUSE APPROVALS TURNING POINTS, Lead in quarters from interest rate turning point



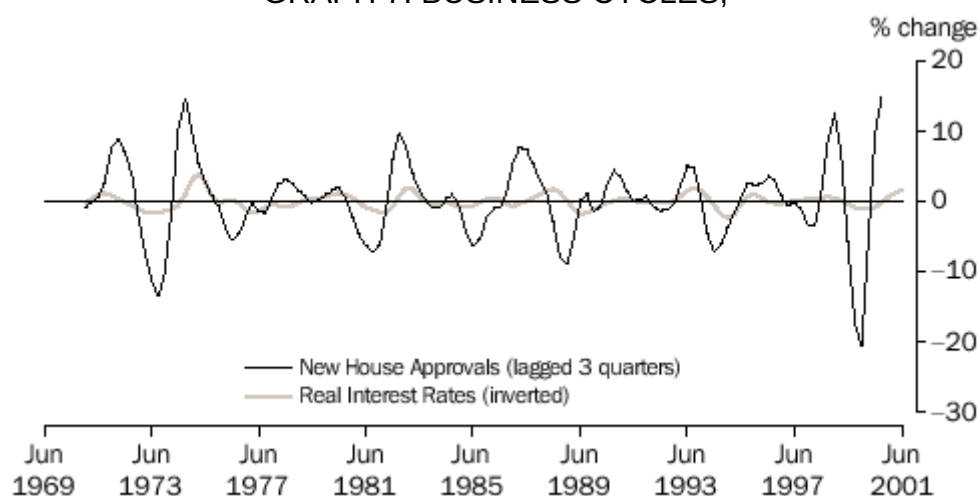
Once all matching turning points have been identified, the lead/lag times for both peaks and troughs can be determined and average lead/lag times calculated. These are shown below. However, given the wide distribution of the lead times evident in graph 5, the average measures need to be treated judiciously.

AVERAGE LEAD/LAG TIMES

Quarters	
Average lead for all turning points	3.2
Average lead for peaks	3.2
Average lead for troughs	3.1

Graph 7 shows the relationship between the inverted interest rate series and new house approvals with a three quarter lag. In this graph the new house approvals value for June quarter 2001 is plotted against the real interest rate (inverted) for September quarter 2001.

GRAPH 7: BUSINESS CYCLES,



CONCLUSION

If it is assumed that changes in interest rates lead to changes in building activity, the above analysis suggests that there has been, on average, approximately a three quarter lag between sustained changes in interest rates and sustained changes in new house approvals. The correlation coefficient is 0.50.

From this analysis it was not possible to extract information on the amplitude of any changes in Building Approvals (or other indicators of construction activity) due to changes in the leading interest rate series. Even so, knowledge about the average lead time of turning points in the interest rate series should assist with anticipating the timing of subsequent changes in building approvals and subsequent building activity.

FURTHER INFORMATION

For further information on this analysis please contact Michael Gurney on Canberra (02) 6252 5487 or email m.gurney@abs.gov.au For general information on Building Approvals, including requests for data, please contact Andrea Woods on Adelaide (08) 8237 7350.

FOOTNOTES

- 1** The Business Cycle in Australia: 1959 to 1992 by Gerard Salou and Cynthia Kim published in AEI in August 1992.
- 2** OECD Leading Indicators and Business Cycles in Member Countries, 1960-1985, Sources and Methods No. 39, January 1987.

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